DOE NEWS

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"Inside-Out" Well Developed To Sample Water and Vapor In Aquifer

Keeping track of aquifer-threatening contaminants beneath the Snake River Plain aquifer is simpler and less expensive with an "inside-out" combination well developed by scientists at the Idaho National Engineering and Environmental Laboratory (INEEL).

The patented well design accommodates simultaneous gas and ground water sampling in the same borehole, a trick that until now required complex well-within-a-well solutions. It also eliminates the need to drill two wells, and then eventually dismantling two wells, saving several thousands of dollars depending on the depth. "The cost was in the drilling," said Joel Hubbell, an advisory scientist with the Integrated Earth Sciences Unit at the INEEL. "Instead of two separate wells, we can now drill one and conduct both water and vapor sampling." The inside-out well is simple to construct, install and operate. Ground water and soil gas sampling activities do not interfere with each other, so the well can be used simultaneously for monitoring and remediation, allowing for direct comparison of data.

Testing of the well was conducted at the Radioactive Waste Management Complex, a low-level radioactive and hazardous waste storage facility overlying the Snake River Plain aquifer. The seven wells and associated data is helping scientists characterize the plume below the aquifer more accurately.

"Conventional designs for ground water and gas sampling wells placed the gas sampling tubes inside the well casing. But this physically interfered with the placement of ground water pumps, also lowered within the well," said Hubbell. By turning the well inside out - attaching the gas sampling tubing on the exterior of the casing - Hubbell eliminated costly problems and streamlined implementation.

A total of 70 combination wells designed by the INEEL for monitoring and remediation have been installed at three other locations in the southwestern U.S. - Tucson Airport, Los Alamos National Laboratory, and NASA White Sands in New Mexico.

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